REMARKS

Claims 1, 3 - 24, 26-28, 30-32, 34-36, and 38-40, are pending in the application, of which claims 1, 24, 28, 32 and 36 are being amended, and claims 2, 25, 29, 33, 37, and 41 to 49 are being cancelled.

Claims 1, 24, 28, 32 and 36 are being amended to include the language of claim 2; and the amendments are also supported by the Specification at page 8, lines 8-21. Thus the claim amendments are fully supported by the Specification and original claims and add no new matter. Consequently, entry of the claim amendments is respectfully requested.

Restriction

The Office Action made a four-way restriction comprising: Group I - claims 1-40 drawn to a method of electrical arcing; Group II – claims 41-43 drawn to a method of casting; Group III – claims 44-46 drawn to a method of pressing; and Group IV – claims 47-49 drawn to a method of friction welding.

Applicant affirms election of the claims of Group I as defined by the Examiner, namely claims 1-40, without traverse.

Claims 41-49 being canceled as drawn to a non-elected invention, and without prejudice or disclaimer.

Claim Objections

Claim 18 was objected to for containing the language "exposing the surface of the target". Claim 18 has been amended to correct this cosmetic error.

Claim Rejections under 35 U.S.C. § 112

The Examiner rejected claims 10-11 and 17 under 35 U.S.C. § 112, second paragraph, on grounds that the claimed "coating comprising chalcogenide material comprising germanium, selenium and tellurium" is indefinite because chalcogens are part of Group 16, and germanium is not classified in Group 16 and is not a chalcogen.

However, Applicant respectfully points out that a chalcogenide is chemical compound which includes at least one chalcogen, but which does not necessarily exclude germanium. For example, the online encyclopedia Wikipedia defines chalcogenide as:

> A chalcogenide is a chemical compound consisting of at least one heavy chalcogen and at least one more electropositive element. Although all group 16 elements of the periodic table are considered chalcogens, the term chalcogenide would not be used to describe an oxide if it did not also have a heavier chalcogen, such as sulfide, selenide, or telluride.

See: http://en.wikipedia.org/wiki/Chalcogenide (November 21, 2007)

As a further example, in the same encyclopedia, chalcogenide glasses are defined as:

> A chalcogenide glass (hard "ch" as in "chemistry") is a glass containing one or more chalcogenide element (Group VI in the periodic table e.g. sulphur, selenium or tellurium) as a substantial constituent. They are covalently bonded materials and may be classified as molecular solids, that is to say the entire glass matrix may be considered as an infinitely bonded molecule.

See cite above.

Further, the language in claims 10 and 17 to "chalcogenide material comprising germanium" has the open ended transition "comprising" which can include any element that may or may not be a chalcogen. The claim language only indicates that the claimed chalcogenide material includes germanium. Chalcogenide materials

can include germanium as an element of the chalcogenide compound, and examples of such chalcogenide materials include GeSb, GeSe, GeTe, GeSbTe, GeSeTe, GeSbSeTe, and TeGeSbS, amongst many other possible combinations of elements.

For these reasons, claims 10 and 17 are not indefinite. Further, claim 11 is dependent upon claim 10 and not indefinite on the same reasons as provided in the above arguments.

Claim Rejections under 35 U.S.C. § 102

1. The Office Action rejected claims 1, 3-7, 12-14, 18-20, 24, 26-28, 30-32, 34-36 and 38-40 under section 102 (b) as anticipated by Vukanovic et al. (US patent no. 4,505,947).

In order to anticipate a reference, each and every element of the claim must be disclosed by a single prior art reference. W.L. Gore & Assocs. V. Garlock, Inc., (Fed Cir. 1983), cert. denied, 469 U.S. 851 (1984).

The Office Action did not reject claims 2, 25, 29, 33, and 37, under this novelty rejection. It should be noted Claims 1, 24, 28, 32 and 36 are being amended, to include, respectively, claims 2, 25, 29, 33, and 37.

As amended, Claim 1 recites a method of refurbishing a deposition target having a pre-sputtered surface with a sputtered depression, the method comprising providing the pre-sputtered surface of the target comprising the sputtered depression, in a process zone; generating an electrical arc in the process zone; inserting a consumable metal wire into the process zone to form liquefied metal; and injecting a pressurized gas into the process zone to direct the liquefied metal into the sputtered depression of the target to at least partially fill the sputtered depression with the liquefied metal.

Vukanovic et al. does not anticipate claim 1 because Vukanovic et al. does not teach "providing the pre-sputtered surface of the target comprising the sputtered depression, in a process zone". Vukanovic et al. also does not teach directing the liquefied metal into the sputtered depression of the target to at least partially fill the sputtered depression with the liquefied metal as claimed. Therefore, since Vukanovic et al. does not teach each and every element of claim 1, Vukanovic et al. does not anticipate claim 1.

For the same reasons, Vukanovic et al. does not anticipate independent claims 24, 28, 32 and 36, which contain the similar language.

For these reasons, the novelty rejection of claims 3-7, 12-14, 18-20, 24, 26-28, 30-32, 34-36 and 38-40, should now be withdrawn.

Claim Rejections under 35 U.S.C. § 103

I. The Office Action rejected claims 8-9 and 15 under section 103 (a) as unpatentable over Vukanovic et al. (US patent no. 4,505,947) as applied to claim 7 and 12 above.

An obviousness rejection requires that the prior art references, when combined, teach or suggest the invention as a whole. Prior art references that are combined must teach or suggest all the claim limitations. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). In making the assessment of differences between the prior art and the claimed subject matter, section 103 specifically requires consideration of the claimed invention "as a whole." Princeton Biochemicals, Inc. v. Beckman Coulter, Inc. (Fed. Cir., No. 04-1493, 6/9/05).

Claims 8-9 and 15 all depend upon claim 1. Claim 1 is not obvious over Vukanovic et al. because Vukanovic et al. does not teach or suggest "providing the pre-

sputtered surface of the target comprising the sputtered depression, in a process zone". Nor does Vukanovic et al. teach or suggest directing liquefied metal into the sputtered depression of the target to at least partially fill the sputtered depression with the liquefied metal as claimed. Thus Vukanovic et al. does not teach claim 1 as a whole.

Further, Vukanovic et al. does not motivate derivation of the present claims because Vukanovic et al. does not teach or suggest the advantages and benefits provided by the present process. As explained in the Background of the present application:

> In these sputtering processes, certain regions of the target are often sputtered at higher sputtering rates than other regions resulting in uneven sputtering of the target surface. Uneven target sputtering can arise from the complex contoured magnetic field maintained about the target to confine or stir energized gas ions about the target surface. Uneven sputtering can also be related to differences in grain size or structure of the target material, chamber geometry, and other factors. Uneven sputtering of the target forms sputtered depressions in the target such as pits, grooves, race-track like trenches, and other recesses, where material has been sputtered from the target at a higher rate than the surrounding areas. The development of these depressions can be undesirable because very deep features can penetrate the target to expose chamber components, such as backing plates, behind the target. Sputtering from the backing plate can contaminate the substrate being processed. Recessed features that are very large or very deep can also affect the deposition uniformity of sputtered material on the substrate.

The claimed process is provided to fill the depressions which are formed on the deposition target during previous sputtering processes:

> The refurbishment process can also at least partially fill one or more depressions 24 with the metal, and can even substantially entirely fill all of the depressions 24 formed in the surface 22. Figures 1b and 1c show re-furbished targets 20 having depressions 24 that have been filled with deposited metal 52 to form a coating 53

> of the deposited metal 52 at the surface 22 of the target 23, where the dotted lines indicate the boundaries of the depressions 24 and target surface before the refurbishment process. The electrical arc method provides an efficient method of refurbishing a pre-sputtered surface 22 with high-purity metal that is cost-effective as well as flexible in terms of the refurbishment of targets 20 having a range of materials and different shapes and sizes of pre-sputtered surfaces.

(Specification, page 9, lines 12-22). The claimed process provides an efficient and cost-effective method of refurbishing a pre-sputtered surface with high-purity metal. It also allows flexible in terms of range of materials and different shapes and sizes of the pre-sputtered surfaces commonly occurring in the refurbishment of targets. Further, the process provides reduced contamination levels of target material that is liquefied and deposited into the depressions of the sputtering target. These benefits and advantages of the claimed process are not taught or suggested by Vukanovic et al..

For these reasons, claims 8-9 and 15 are not obvious over Vukanovic et al..

II. The Office Action rejected claims 10-11 and 16-17 are rejected under section 103 (a) as unpatentable over Vukanovic et al. (US patent no. 4,505,947) as applied to claim 7 and 12 above, and further in view of Wu et al. (USPG Publication no. 2003/0102207)

Claims 10-11 and 16-17 all depend upon claim 1. Claim 1 is not obvious over Vukanovic et al. and Wu et al. because neither reference teaches or suggest "providing the pre-sputtered surface of the target comprising the sputtered depression, in a process zone" as claimed. Vukanovic et al. teaches a substrate 43 , which in Example 1 is described as a flat quartz substrate. A quartz substrate is not a target that is sputtered or which has depressions formed by sputtering. Nor does the Vukanovic et al. teach or suggest that the quartz substrate has sputtered depressions that should be filled. Vukanovic et al. also does not teach or suggest directing liquefied metal into the

sputtered depression of the target to at least partially fill the sputtered depression with the liquefied metal as claimed. Thus Vukanovic et al. does not teach claim 1 as a whole.

Wu et al. does not make up for the deficiencies of Vukanovic et al. because Wu et al. also does not teach or suggest directing liquefied metal into the sputtered depression of the target to at least partially fill the sputtered depression with the liquefied metal as claimed. Instead Wu et al. teaches a method of producing nano powders (Abstract).

Further, neither Vukanovic et al. nor Wu et al. teach or suggest the advantages and benefits provided by the present process, namely, the ability to fill non-depression regions of a deposition target that are sputtered off at higher sputtering rates than other regions in sputtering processes, to extend the life of a deposition target. In many deposition processes, uneven sputtering of the target surface can significantly reduce target life. Moreover, the depressions can have depths or other dimensions that very across the target surface making it difficult to uniformly fill these depressions. The claimed process fills these depressions on the deposition target in an efficient, controllable, and cost-effective method. It also allows refurbishing a pre-sputtered surface with high-purity metal without excessive contamination. These benefits and advantages of the claimed process are not taught or suggested by Vukanovic et al. or Wu et al..

For these reasons, claims 10-11 and 16-17 are not obvious over Vukanovic et al. and Wu et al..

III. The Office Action further rejected claims 21-23 under section 103 (a) as unpatentable over Vukanovic et al. (US patent no. 4,505,947) as applied to claim 18, and further in view of Lee et al. (US patent no. 7,192,235)

Claims 21-23 all depend upon claim 1. Claim 1 is not obvious over Vukanovic et al. and Lee et al. because neither reference teaches or suggest providing a pre-sputtered surface of the target comprising the sputtered depression, in a process zone. Vukanovic et al. teaches a substrate 43 which in Example 1 is a flat quartz substrate – which is not a deposition target and is not used for sputtering material. Nor does the Vukanovic et al. teach or suggest that the quartz substrate has sputtered depressions that should be filled. Vukanovic et al. also does not teach or suggest directing liquefied metal into the sputtered depression of the target to at least partially fill the sputtered depression with the liquefied metal as claimed. Thus Vukanovic et al. does not teach claim 1 as a whole.

Lee et al. does not make up for the deficiencies of Vukanovic et al. because Lee et al. also does not teach or suggest directing liquefied metal into the sputtered depression of the target to at least partially fill the sputtered depression with the liquefied metal as claimed. Instead Lee et al. teaches a method and apparatus for chemically, mechanically, and/or electrolytically removing material from a microelectronic substrate. (Abstract.) A microelectronic substrate is not the same as a deposition target. Further, Lee et al. describes a process for removing material from the microelectronic substrate rather than filling depressions on the substrate. Clearly, Lee et al. does not teach or suggest directing liquefied metal into the sputtered depression of the target to at least partially fill the sputtered depression with the liquefied metal as claimed.

Further, neither Vukanovic et al. nor Lee et al. teach or suggest the advantages or desirability of filling depression regions on a deposition target which are formed when the deposition target is sputtered. Nor do the cited references recognize

that a sputtered target has regions which are sputtered at higher sputtering rates than other regions, and which when filled with material, can extend the life of a deposition target. Further, the cited references do not recognize the advantages of the claimed process for filling depressions which have depths or other dimensions that very across the target surface making it even more difficult to uniformly fill these depressions. The claimed process fills these depressions on the deposition target in an efficient, controllable, and cost-effective method. The process also allows refurbishing a pre-sputtered surface with high-purity metal. These benefits and advantages of the claimed process are not taught or suggested by Vukanovic et al. or Lee et al..

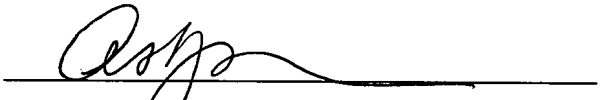
For these reasons, claims 21-23 are not obvious over Vukanovic et al. and Lee et al..

CONCLUSION

Should the Examiner have any questions regarding the above remarks, the Examiner is requested to telephone Applicant's representative at the number listed below.

Respectfully submitted,
JANAH & ASSOCIATES, P.C.

Date: November 26, 2007

By: 

Ashok Janah
Reg. No. 37,487

Please direct telephone calls to: Ashok K. Janah at (415) 538-1555.

Please send correspondence to: Janah & Associates, P.C.
650 Delancey Street, Suite 106
San Francisco, CA 94107